

REMARKS

Claims 1-8 are all the claims pending in the application.

Claim 1 has been amended for clarify to recite that a low-temperature sealing material usually usable at a temperature of around 100°C is used at the flange. Claim 1 has also been amended to recite a reaction apparatus comprising a heat exchanger and a reactor with a heater, which are enclosed in an outer casing having a bottom, a ceiling wall part and a side wall part, wherein the ceiling wall part and the side wall part of the outer casing are integrally formed, or the outer casing has an integrated structure where the ceiling wall part and the side wall part are integrally joined. Further, claim 1 has been amended to recite that the flange is provided so that the distance from the flange to the bottom end of the reactor is about 190 mm or more. Support for the amendment to claim 1 can be also be found in the specification, for example, at page 9, lines 18-21 and at page 18, lines 7-8 and Fig. 3 and Fig. 4.

Applicants wish to point out that as shown in Figures 3-4 of the present application, the temperature distribution inside the reactor can be kept uniform when the distance from the flange to the reactor is about 190 mm or more. Consequently, it is clear that if the flange is provided so that the distance from the flange to the reactor is 190 mm or more, it can prevent the flange from being baked by suppressing overheating.

No new matter has been added since entry of the proposed amendments reduce issues for appeal and/or place the appreciation in condition for allowance, entry of the Amendment is respectfully requested.

I. Drawings

As an initial matter, Applicants respectfully request the Examiner to acknowledge the receipt and confirm the acceptance of the drawings (four sheets of drawings, Figures 1-5) filed on September 24, 2004.

II. Claim Rejection under 35 U.S.C. § 112

Claim 1 is rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement.

Without acquiescing in the merits of the rejection, claim 1 has been amended for purpose of clarity to recite that a low-temperature sealing material usually usable at a temperature of around 100°C is used at the flange.

Withdrawal of the foregoing rejection of claim 1 under 35 U.S.C. §112, first paragraph, is respectfully requested.

III. Claim Rejections under 35 U.S.C. § 103(a) Based on Christensen

Claims 1, 2, 6 and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable in view of Christensen (US 3,041,151) in view of a newly cited reference Stern al. (US 5,242,563; “Stern”).

Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Christensen and Stern, and further in view of Keto et al. (US 3,732,517).

Claims 4 and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Christensen and Stern, and further in view of Serratore et al. (US 3,278,633).

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Christensen and Stem, and further in view of Nakamura et al. (US 3,814,171).

Applicants respectfully traverse the above rejections.

The Examiner acknowledges that while Christensen teaches an apparatus which comprises an outer shell joined to a flange to provide a seal, Christensen does not disclose a low temperature sealing material on the flange.

Stern is then relied upon as disclosing an apparatus which discloses an outer shell (20,14) of a reactor which is joined to a flange (18) in order to provide a seal (see Fig. 1). The Examiner asserts that Stern teaches the use of a rubber gasket/sealing material between the outer shell and the flange in order to provide a better seal from the outside environment (col. 4 lines 8-10).

The Examiner takes the position that it would have been obvious to one of ordinary skill in the art at the time of the invention to add the rubber seal (an “O” ring) of Stern, to the flange of Christensen in order to provide a better seal between the outer shell and the flange. Applicants respectfully disagree.

Applicants respectfully submit that one of ordinary skill in the art would not be motivated to modify Christensen to add a rubber seal (an “O” ring) of Stern in the manner suggested by the Examiner. Even if combined, the suggested combination of Christensen and Stern would not arrive the claimed reaction apparatus, as recited in claim 1 of the present application.

Specifically, Christensen discloses a reactor wherein the bottom of the outer casing is fastened to the lower end part of the heat exchanger by a cap (flange). However, Christensen

does not disclose or teach suppressing overheating of the flange portion and thereby using a sealing material composed of a normal low-temperature construction material for the flange.

Stern discloses an “O” ring made of rubber, which may be interposed between flange 20 and cover 18. Column 4, lines 8-10. However, the flange 20 of Stern does not fasten a part such as a heat exchanger which is exposed to a high temperature.

Thus, even if Christensen and Stern are combined in the manner suggested by the Examiner, the “O” ring made of rubber by Stern employed in the flange of Christensen can not always prevent the flange from being baked by overheating at a high temperature.

Keto, Serratore and Nakamura, either alone or in combination, do not make up the noted deficiencies of Christensen and Stern.

On the other hand, the reaction apparatus of the present application is formed by fastening the heat exchanger connected to a reactor and the outer casing surrounding the heat exchanger with a flange, and is characterized in the structure where the heat exchanger is provided between the reactor and the flange so that the reactor is kept at a certain distance (190 mm or more) from the flange to prevent the flange being baked by overheating at a high temperature. Given such a structure, the present invention facilitates the maintenance such as changing the catalyst.

Further, claim 1 presently recites that a reaction apparatus comprising a heat exchanger and a reactor with a heater, which are enclosed in an outer casing having a bottom, a ceiling wall part and a side wall part, wherein the ceiling wall part and the side wall part of the outer casing are integrally formed, or the outer casing has an integrated structure where the ceiling wall part and the side wall part are integrally joined; and that the flange is provided so that the distance from the flange to the bottom end of the reactor is about 190 mm or more.

None of the cited references discloses or suggests the recitation that the flange is provided so that the distance from the flange to the bottom end of the reactor is about 190 mm or more, as required by the present claim 1.

In view of the above, it is respectfully submitted that the present claims are patentable over Christensen, either alone or in view of Stern, and further in view of Keto, Serratore and Nakamura. Applicants respectfully request reconsideration and withdrawal of the present §103 rejections of claims 1-8.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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